Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

FRIDAY, JUNE 6, 1862.

INTERNATIONAL EXHIBITION OF 1862.

SEASON TICKETS.

Members of the Society and others are informed that Season Tickets may be obtained at the Society's house, on application to Mr. S. T. Davenport, the financial officer. Price three guineas and five guineas, the latter also admitting to the Horticultural Gardens and *fetes* during the season.

GUARANTEE.

The Council beg to announce that the Guarantee Deed is still lying at the Society's House for signature, and they will be much obliged if those gentlemen who have given in their names as Guarantors, as well as others interested in the Exhibition, will make it convenient to call there and attach their signatures to the Document. Signatures for sums amounting in the aggregate to £451,800, have been attached to the Deed.

ELEVENTH ANNUAL CONFERENCE.—NOTICE TO LOCAL BOARDS.

The Eleventh Annual Conference between the Representatives of the Institutions in Union and the Council, will be held on Monday, the 23rd inst., at 12 o'clock, noon. Sir Thomas Phillips, Chairman of the Council, will preside.

Secretaries of Institutions in Union are requested to forward, *as soon as possible*, to the Secretary of the Society of Arts, the names of the Representatives appointed to attend the Conference, stating at the same time, if possible, whether those gentlemen will also be present at the Society's Annual Dinner, which will take place on the following day, and of which particulars are given below.

The Chairmen of, or Representatives from, the Local Boards of Examiners are invited to attend.

ANNUAL DINNER.

The One Hundred and Eighth Anniversary Dinner of the Society will take place in the Refreshment Room over the Central Entrance from the International Exhibition Building to the Horticultural Gardens, on Tuesday, the 24th inst., at half-past five for six o'clock punctually. The Right Hon. W. E. Gladstone, M.P., will preside.

Applications for tickets (price fifteen shillings each) should be made after Wednesday, the 11th inst., to Mr. S. T. Davenport, at the Society's House; and it is particularly requested that those who intend to be present will take their tickets as early as possible in order to facilitate the arrangements.

CONVERSAZIONI.

The second and third Conversazioni of the present season will be held at the South Kensington Museum, on the 9th of July and the 8th of October.

WHAT IS GOOD IRON, AND HOW IS IT TO BE GOT?

The following remarks, bearing upon a very important question, will be found not without interest:—

What is good iron, and how is it to be got? The conviction is daily gaining ground that by the penny-wise and improvident use of inferior qualities of iron much capital has of late years been wasted and much risk incurred. And in such a case it might be thought that to discover the error was all that is needed to amend it. If a brown loaf will not serve the purpose, let those who have money buy a white one, and there is an end of the difficulty. But the analogy does not hold. There is some obstacle in the background which is the more formidable for not being clearly seen or understood. The newspapers tell us of works retarded at the dockyards because the Admiralty cannot get the iron they require, and of "angle bars" rejected and returned on the hands of respectable firms who cannot have wanted the will to satisfy their critical customers. Great railway companies have begun to make their own rails, because they despair of obtaining in any other way the requisite quality. And all this at a time when for four years the price of iron, good as well as bad, has been falling, or in other words the supply has constantly exceeded the demand! How comes it that the prodigious development of the iron trade has led to a state of confusion in which, as it would seem, good iron can neither be bought nor sold? It is the object of this paper to offer an explanation of this paradox.

From the very first the progress of the iron manufacture has shown itself only in the increased facility and diminished cost of production. In the quality of the produce there has been no improvement since, in days anterior to history, a small quantity of iron was extracted from the best ores, which alone were then available, by the rudest and most laborious process.

The great discovery of smelting iron by means of pit-coal effected a change in the manufacture which has assured to England the command of the markets of the world, but has lowered the quality of the iron. There are purposes which iron thus smelted will not serve, and accordingly a small quantity of iron smelted, as of old, with charcoal, is still made in this country, and further supplies are imported from Sweden.

In our own days the introduction of the "hot blast" has brought about a second revolution in the manufacture hardly less important than the first in its results, but unfortunately qualified with a larger alloy of evil. Between thirty and forty years ago it was discovered that by heating to a very high temperature the "blast" which maintains the combustion of the smelting furnace a great saving in the quantity of fuel might be effected. This led to the further discovery that not only might the coal be used in its raw state, by which the expense and the loss of coking were saved, but that coal which had hitherto been rejected for its noxious qualities might now be sent to the furnace; and subsequently by the same means even the intractable anthracite was pressed into the iron master's service. Hitherto only the superior argillaceous ores of the midland districts could be profitably converted into iron; but by the application of the hot-blast the metal was extracted from every substance that contained it. The "black band," which had resisted all attempts to make it productive, became a mine of wealth to its possessors; and as the minerals of the Cleveland, Northamptonshire, and other districts were successively discovered, they were converted into cheap and serviceable although inferior iron. It was also found (and of all the benefits of the hot-blast this is the most questionable) that the cinder or refuse of the puddling forge, hitherto of no value, would, when added to the materials of the hot-blast furnace, yield a large percentage of iron (though of very inferior quality), and thus increase the bulk though it damaged the character of the produce. The pig-iron thus made is always designated in the trade as "cinder-iron."

Pig-iron, as most readers are aware, is the name given to the thick coarse-looking bars into which the molten metal is formed in moulds of sand as it runs from the furnace. It is the raw material of all the subsequent operations of the manufacture, and on its quality the quality of all that is made from it depends. The changes which the metal undergoes in the various processes to which it is subjected are so important that the three forms in which it is best known to the public—pig-iron, wrought iron, and steel—are virtually distinct metals; yet the two first are both indiscriminately called "iron," when the context is supposed to make it clear which is meant; and this loose nomenclature is apt to occasion some confusion to those who are applying themselves to the subject for the first time.

The annually increasing quantity of cheap pig-iron thus thrown into the market compelled the iron masters who possessed the best minerals and the best fuel to reduce by every expedient their own cost of production; and gradually the pressure of competition induced them to employ the hot-blast to a considerable extent.* Where they have done this without unduly lowering the quality of the materials, the "hot-blast iron" so produced bears a very high character; but, unfortunately, many of them have availed themselves of the hot-blast to bring into use any materials which would enable them to compete in price with the makers of the cheapest iron, and thus the name of the district has ceased to be of itself a sufficient guarantee for the quality of its produce.

The application of this new agency to so many new materials had the effect of sending into the market, not only an increased quantity of iron, but a variety of quality such as hitherto had been unknown. At the head of the list stands the grey cold-blast iron. By untoward accident, or by want of care or skill, the produce of the cold-blast furnace may turn out mottled or white, and is then of inferior value. But the grey cold-blast iron by its name gives a guarantee for the quality of its materials, and is therefore divided by a strong line of demarcation from all "hot-blast" whatever; nevertheless, the difference between the cold-blast and the best "hot-blast" made from the clay ironstones without any admixture of cinder is small in comparison with that which separates the best hot-blast from the worst. It might fill a volume to describe the various properties and uses of the various kinds of iron. It is sufficient to note that only two kinds, the cold-blast and the best hot-blast, will bear repeated "working" without losing their fibrous texture. These are not matters of opinion or bare assertions, to be received with caution. It is manifest that if the cheaper kinds of iron were not inferior in quality to the more costly, the cheapest would long ago have driven all others out of the market. The "price-lists" published from time to time show pretty accurately the estimation in which the produce of the different materials and modes of manufacture is held by the trade; and undoubtedly this variety of quality in pig-iron and latitude of choice would be an unmixed benefit, if all manufacturers were perfectly honest and all their customers absolutely wise.*

The increased supply of cheaper iron was, in fact, needed for the development of modern civilisation, and in the first instance produced unqualified good. For many purposes inferior iron was found to answer as well as the best. A kitchen poker need not have the strength of a battering-ram, and iron was now applied to uses for which formerly it would have been thought as reasonable to employ the precious metals. At this time it requires an effort of memory to recollect how very recent is the application of iron to fencing and various other agricultural and domestic purposes, for which it is now used as a matter of course.

But throughout the history of the iron manufacture, good and ill are inseparably interwoven. The efforts to discover the cheapest iron that would just serve the purpose, often degenerated into the use of iron that would just not serve the purpose—that served it to the eye, but not to the hope—ending in such imprudent applications of it as cannot be made without the most serious risk to human life. The subject is too familiar to most readers to need much illustration. The following instances present in strong contrast the different results of true and false economy.

In a conversation which took place in the house of Commons on the recall of Sir Baldwin Walker, Lord Clarence Paget is reported to have stated that the cylinders of the *Himalaya* were defective; and a few days subsequently the papers informed us that they "were to be renewed." The *Himalaya* has been afloat at most but a few years. On the other hand there is to be seen in an old iron-work in the midland district (and this is only one of many similar instances) a 94-inch blowing cylinder made in the days of good iron (it is marked "Bersham, 1801"), which has been in constant use night and day for fifty-five years, and is still perfectly sound and fit for service.

When rails were first manufactured for the newly projected lines, they were made of a quality which might in some degree be expected to bear the friction and the momentum of the prodigious masses which were to be whirled over them. But the cost of such rails was considerable; their merit was not discernible by the eye. Directors were ignorant, engineers inexperienced. The present was all important, and competition was hot. Inferior iron, and, worst of all, cinder-iron (the nature of which has been already explained) was employed almost of necessity, and all but universally. The consequence is, that the greater part of the lines need relaying, years before such an expenditure ought to be required. Nor does the mischief stop here. What is to become of the prodigious mass of old rails? If the railway Boards work them up again (and the temptation is all but irresistible), they only repeat the error; or if a portion of these rails is sold as "scrap-iron," who is sanguine enough to hope that it will be purchased only for those purposes to which inferior iron can fitly be applied? There is no escaping from the consequences of the first fault, and these cinder-rails will long be bandied about to burden the market and infect the manufacture of the country.

It is to the credit of the railway companies and the mechanical engineers that they have from the first seen the importance of making the boilers for the locomotive engines as strong as the best material could make them; and accordingly scarcely an accident is recorded which can be attributed to a failure in the quality of the boiler-plates.

In the same spirit, when iron merchant-vessels first came into use, their plates were made of the tough fibrous iron used for ordinary boiler-plates, and the result corresponded with the prudence of the design. The *Great Britain*, stranded in Dundrum Bay, withstood for months the beating of a surf such as no floating work of man's hands had ever stood before, or ever will stand again, till shipbuilders change their present short-sighted policy. The success of the first iron boats was complete. Their cost was amply repaid by their durability and the cheapness of their repairs. "But could they not be made for less?" asked the Spirit of Gain. "No doubt they could," answered Competition. Other plates of inferior construction, to which the distinguishing name of "boat-plate" was given, were forthwith manufactured. A "boat-plate" may be had for from 20s. to 30s. per ton less than a "boiler-plate." The saving thus effected in so large an expenditure is trifling, the difference in security and durability is very great. Six Baltic steamers belonging to the port of Hull have been lost in scarcely more than a twelvemonth. How many more of these cheap iron vessels have left our shores and have never since been heard of! and how often must these mysterious disappearances be multiplied, before our shipowners are convinced of their mistake! It is understood that the under-writers have taken up the subject. The increased rate of insurance on cheaply-built iron boats will give some measure of the additional risk occasioned by this ill-judged parsimony, and may perhaps weigh with those, if any such there be, to whom higher motives appeal in vain.

---

* In many instances the exhaustion of the best materials has made this necessary.

* 'Quarterly Review,' No. 217; *vide* an article on the Iron Manufacture, which contains a compendious account of its progress.

But although in this and similar cases it is natural to inveigh against the avarice and inhumanity which incur such risks, it is more just to attribute the error to ignorance and divided responsibility, and to the whirl of competition, which does not leave the time for thought, and scarcely even—as conscience would fain persuade herself—the liberty of choice. The ship-owner has no notion how much the reduction of the price diminishes the strength of the plates; the manufacturer knows nothing of the forces which the plates should be calculated to resist. Both may be humane and sensible men, but between the two the ship, the cargo, and the crew are lost. Competition is the vital principle of progress in the arts and manufactures, but like all other strong incentives to human action, it produces evil in large proportion to the good. Cheapness is a most legitimate object of pursuit, but it is rightly pursued so long only as there is a distinct understanding between the buyer and the seller as to the effects of cheapness upon quality. Practically, such an understanding rarely exists. The public insists upon cheapness, and chooses to ignore the conditions on which alone cheapness can be obtained. The manufacturer is tempted or obliged to follow the impulse given by the public, and in furnishing a bad article pacifies his conscience by the reflection that "it is good enough for the money;" and further, when the public carries its exigency to the point of demanding impossibilities, impossibilities are promptly and unscrupulously performed. The detriment which over-eager competition causes to the commerce of the world and to its morality is incalculable, but in all this the short-sighted public plays the part of the tempter, and must be content to take its share of the blame. And there is yet worse behind. The public having encouraged the production of a cheap and worthless article, has no security for obtaining a good one even when willing to pay its price. There are tricks in all trades; and assuredly the iron-trade forms no exception. The iron-master, who requites confidence and a liberal order with fraud and a bad article, commits a folly which must in the first instance recoil on himself, but which in its consequences affects the innocent. Such instances, it is to be hoped, are rare, but a very few will do irreparable mischief. Hence arises the general distrust which is a prominent cause of the present confusion in the iron-trade; and hence it is that, among those who are ignorant of the facts, there gets abroad a vague and confused notion, compounded of indolence and disappointment, that either good iron is no longer to be had, or that good iron after all differs little from bad.

And what is the condition of the market and manufacture of iron which has resulted from the introduction of this new and powerful agency, the hot-blast?

It is obvious that the steadily increasing supply of an article for which the demand fluctuates with every vicissitude by which the general commerce of the country is affected, must occasion great variations in the price. The periods of depression which for many years past have recurred at uncertain intervals are often spoken of as "capricious" and "unintelligible;" that is to say, their causes are so complicated and obscure, that nothing relating to them can be predicted or explained with certainty even by those most interested in observing closely. But the one cause, which is necessary to their existence is *over-production.*

Throughout all these fluctuations, as might be anticipated, there is to be traced a steady decline of price. In 1806, according to tables published at Liverpool, "merchant bars" (finished iron) made from cold-blast pig-iron (for none other was then known) were quoted at £17 10s., per ton. In 1861 the best make of Staffordshire had sunk to £7 10s., and Welsh bars might have been bought for even less than £5 15s. It is true the present is a time of unusual depression, but if we take the average price which finished iron must maintain, if it is to remain a staple manufacture of the country (about £8 per ton), even thus the reduction is prodigious; and if cheapness were the only measure of progress, the advance would be great indeed.

With regard to the manufacture, printed returns give us the following facts:—

In the year 1840 the total make of Great Britain is stated at what was then thought the marvellous amount of 1,396,000 tons. In 1860 it had risen to 4,156,000 tons, and to such an extent has the productive power of the country increased, that to this prodigious total another million might, on any sudden demand, be added without any additional expenditure on buildings or machinery, or "plant," as such previous preparations are technically termed. It must also be noted that great skill has been acquired in the art of correcting the defects of the inferior kinds of iron by judicious mixtures, and thus giving them the highest quality of which they are susceptible. But these brilliant results are qualified by a fearful drawback. In the year 1840 the cold blast iron amounted to 771,000 tons, or considerably more than half the whole make. In 1860 it is a significant fact that the distinction between hot and cold blast is no longer noted in the returns; but of the aggregate make of 4,166,000 tons it is not possible to estimate the portion of cold blast at more than the odd 156,000 tons. Those best acquainted with the trade agree that in the year 1860 there could scarcely have been more than thirty furnaces blown with cold blast, and that the annual production of each of these cannot be rated at so high an average as 5,000 tons. Perfect accuracy cannot be attained, as perpetual changes are taking place in the ironmasters' arrangements, and little is known of the production of those pig-iron manufacturers who consume at their own forges the produce of their furnaces. But this calculation is sufficiently near the truth to justify the assertion that, while in twenty years the total make of the country has been trebled, the cold-blast has dwindled down to one-fifth of its former amount; and whereas in 1840 it constituted considerably more than one-half of the aggregate produce of the iron manufacture, in 1860 it sunk down to about one twenty-ninth. Assuredly if there was not a great redundancy of cold-blast pig-iron in the year 1840, there must have been a great deficiency of it in the year 1860.

But every ironmaster knows that in the year 1840 there was no wasteful employment of cold-blast iron. Even then complaints of its scarcity were to be heard, and since that time the need for the best iron has increased, and many new uses for it have been invented. Let any man practically acquainted with the requirements of the various branches of the iron-manufacture make his estimate of the probable demand for first-class pig-iron, and then compare it with the supply; or let us suppose some commission of ironmasters possessed of the despotic power with which the captain of a ship, in time of scarcity, regulates the short allowance, and empowered to dole out to each manufacture the supply of cold-blast iron supposed to be indispensable to its operations; such a tribunal would find that the disproportion between the estimated demand and the possible supply was enormous: nor would the difference between the estimated and the actual demand be less striking; and the divergency of practice from theory thus indicated is a subject of very grave anxiety.

For some time past a vague dissatisfaction with the state of the iron trade—an uneasy consciousness of something wrong—has perplexed the public mind; and now, when, by the employment of iron as the principal means of warlike defence, the iron manufacture has been invested with a political and national interest, a desire is generally felt to bring it back to a sounder state. But it is easier to lose the right way than to find it again. It is the opinion of men best acquainted with the trade, that neither the present make of cold-blast iron, nor even that of the best hot-blast, could be very suddenly or very greatly increased. It is fortunate that among the numerous works which the pressure of the times has closed, very few of those making superior qualities of iron are included. If a large and steady demand for good iron were to arise, the manufacturers of pig-iron would have a motive for retracing their steps as far as is still possible; and in the districts where the best materials are to be found, quality rather than cheapness would again be their aim. Where the materials are partially exhausted, the deficiency might, to some extent (thanks to the increased facilities of traffic) be supplied from other districts. And although no great and strongly-marked change is possible, it may be hoped that the aggregate of many small augmentations to the quantity of first-class iron might swell to a larger total than is generally supposed possible. But till the demand for the best pig-iron occurs, the ironmaster cannot be expected to stir, and as yet there are many causes to prevent its occurrence. The old traditions of the iron trade are lost. Thirty years wear out more than one generation of working-men. The great maxim—that the best article can be made only from the best materials—that is to say, the best pig-iron from the best minerals, and the best wrought iron from the best pig-iron—might, indeed, seem too simple and too important to be forgotten, and too obvious to need much argument for its re-establishment. But practically it has fallen into disuse, and powerful interests are arrayed against it. Whole districts have for years been actively engaged in the struggle to make inferior iron supply the place of good, and motives of interest and self-love combine to induce the belief that it really will serve as well. We are not referring to recent ingenious inventions for removing impurities from inferior kinds of iron, by special processes and at an increase of expense, but simply to the substitution of iron that will indifferently answer the purpose for iron that will answer it effectually. Men of great practical skill have been reared up in the business, who nevertheless have had little experience of the best iron, and are indisposed to admit its necessity. As the iron manufacture extends, and its operations become more varied, the knowledge required by the manufacturer is at once more extensive and more minute, and more difficult of attainment. The reader unacquainted with the iron-trade must be told that pig-iron is classified according as it is more or less grey, and consequently better adapted for the foundry or for the forge. But in no two districts does the classification exactly agree, and in no two works even is the iron of precisely the same character and quality. Moreover, by the exhaustion of the materials, or a change of operations, changes in the quality of the produce are constantly occurring which are not indicated by any corresponding change of name; and often under the same names are classed things of very different value. Thus, for instance, the hard and the unctuous hæmatite ores differ from each other materially in quality; yet the iron made from each is comprehended under the common name of "hæmatite;" and numberless similar facts might be added to show how exact is the knowledge that is needed of the market and its changes. But while the craft of the wrought-iron manufacturer is daily becoming more difficult, it more frequently happens that men are drawn into the iron-trade who had no previous knowledge of its details, and are obliged to trust to a manager for the general conduct of the business, and to a broker for a supply of the proper pig-iron. The manager is often biassed by local predjudices, the broker is imperfectly acquainted with his principal's requirements. When the broker turns iron-merchant, there is no doubt his speculations in a time of depression lighten its severity to the producers of iron, but his interest is no longer in exact accordance with those of his employer, or, as he now becomes, his customer. When prices are low there is no room for the profits of a middleman, and his efforts to make one cause an additional complication in the confusion of the market.

In the midst of all this perplexity one object only—price—is clearly discerned by the manufacturer. As to the qualities of iron and its uses, he is puzzled by the most conflicting opinions and the most contradictory statements. Truth flies from him, even if he is quite sincere in seeking it. But the saving of so much per ton in the pig-iron, which is his raw material, is a palpable fact, about which there can be no mistake. The very skill which has been attained in making the most of the inferior kinds of iron by mixing and manipulation contributes to mislead him. He trusts to it for more than it can effect, and not unfrequently spends more in the vain effort to turn bad iron into good than it would have cost him to purchase the right material at first.

(*To be continued.*)

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The thirty-second meeting will commence on Wednesday, the 1st of October, 1862, under the direction of the following officers:—President, Rev. R. Willis, M.A., F.R.S., Jacksonian Professor of Natural and Experimental Philosophy in the University of Cambridge. Vice-Presidents—The Very Rev. Harvey Goodwin, D.D., Dean of Ely; the Rev. W. Whewell, D.D., F.R.S., Master of Trinity College, Cambridge; the Rev. A. Sedgwick, M.A., D.C.L., F.R.S., Woodwardian Professor of Geology in the University of Cambridge; G. B. Airy, Esq., M.A., D.C.L., F.R.S., Astronomer Royal; J. C. Adams, Esq., M.A., D.C.L., F.R.S., Pres. C.P.S., Lowndean Professor of Astronomy and Geometry in the University of Cambridge; G. G. Stokes, Esq., M.A., D.C.L., Sec. R.S., Lucasian Professor of Mathematics in the University of Cambridge. General Secretary—William Hopkins, Esq., M.A., LL.D., F.R.S., F.G.S., Cambridge. Assistant General Secretary—John Phillips, Esq., M.A., LL.D., F.R S., F.G.S., Professor of Geology in the University of Oxford, Oxford. General Treasurer—William Spottiswoode, Esq., M.A., F.R.S., F.G.S., F.R.A.S., &c., 19, Chester-street., Belgrave-square, London, S.W. Local Secretaries for the meeting at Cambridge—Charles C. Babington, Esq., M.A., F.R.S., F.L.S., Professor of Botany in the University of Cambridge. G. D. Liveing, Esq., M.A., Professor of Chemistry in the University of Cambridge. The Rev. N. M. Ferrers, M.A., Gonville and Caius College. Local Treasurer for the meeting at Cambridge—The Rev. W. M. Campion, M.A., Queen's College.

The general committee will meet on Wednesday, the 1st of October, at 1 p.m., for the election of sectional officers, and the despatch of business usually brought before that body. On this occasion there will be presented the report of the council, embodying their proceedings during the past year. The general committee will meet afterwards by adjournment.

The first general meeting will be held on Wednesday, the 1st of October, at 8 p.m., when the President will deliver an address; the concluding meeting on Wednesday the 8th of October, at 3 p.m., when the Association will be adjourned to its next place of meeting.

At two evening meetings, which will take place at 8 p.m., discourses on certain branches of science will be delivered.

There will also be other evening meetings, at which opportunity will be afforded for general conversation among the members.

The Committee of Sections will meet daily, from Thursday, the 2nd of October, to Wednesday, the 8th of October inclusive, at 10 a.m. precisely.

The Sections will meet daily, from Thursday, the 2nd of October, to Tuesday, the 7th of October, inclusive, at 11 a.m. precisely.

Reports on the Progress of Science, and of Researches entrusted to individuals and committees, and other communications intended for presentation to the sections, are expected to be forwarded in letters addressed to the Assistant General Secretary, at Cambridge, previously to the meeting, accompanied by a statement whether the author will be present, and on what day, so that the business of the sections may be satisfactorily arranged.

The Reports complete, and concise Abstracts of other communications, are to be delivered to the Secretaries of the Sections before which they are read, previously to the close of the meeting, for publication in the Transactions. As the Reports on Science may be more interesting to more Sections than the one which originally called for them, it is desirable that the authors should be prepared to furnish the means of reading them in any other section at the request of the President and Secretaries of that Section.

The following are the titles of the sections to which communications may be presented:—Section A. Mathematics and Physics. B. Chemistry and Mineralogy, including their applications to Agriculture and the Arts. C. Geology. D. Zoology and Botany, including Physiology, Sub-Section D. E. Geography and Ethnology. F. Economic Science and Statistics. G. Mechanical Science.

Members will receive their tickets in the Reception Room according to their Class of Membership, separate registers being appointed for Old Life Members, Old Annual Subscribers, New Annual Subscribers and Associates.

Gentlemen desirous of attending the Meeting will find in the reception room blank forms of proposal, and may make their choice of being proposed as life members, paying ten pounds as a composition, or annual subscribers paying one pound annually and an admission fee of one pound (making together two pounds on admission), or associates for the meeting, paying one pound.

Ladies may obtain tickets, through the application of a member, in the reception room, price one pound each ticket. These tickets are transferable to other ladies only.

Compositions, subscriptions and arrears are received during the meeting in the reception room, and at all times by the Local and General Treasurers.

NATIONAL ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE, AND INTERNATIONAL PHILANTHROPIC CONGRESS.

The Sixth Annual Meeting, held in London, 1862, commenced yesterday, and will last till the 14th inst.

The following are the officers for the present year:—President—the Right Hon. Lord Brougham; President of the Congress—the Right Hon. the Earl of Shaftesbury, K.G.; Vice-Presidents—the Right Hon. the Lord Mayor; His Excellency M. Van de Weyer; Earl Granville, K.G., Chancellor of the University of London; the Lord Bishop of London; Major-General Sabine, President of the Royal Society; General Secretary and Chairman of the Executive Committee—George W. Hastings, Esq.; Finance Secretary—Andrew Edgar, Esq.; Foreign Secretary—George Whitley, M.D.; Secretary to the Executive Committee—J. H. Randall, Esq.

The following is the programme of arrangements:—

Members.—Any person (lady or gentleman) becomes a member on payment of one guinea, and receives a ticket of admission to all the meeting and soirées. Every member is also entitled to a volume of the Transactions for the year.

Ladies may join the association as members, as above; or they may obtain, on payment of a half-a-guinea, a ticket of admission to the meetings and soirées.

Societies and other public bodies may become corporate members on payment of two guineas, and are entitled to send three delegates to the meetings and soirées and to receive a volume of the Transactions for the year.

The Guildhall, with the Courts adjoining, has been placed at the disposal of the Association by the Lord Mayor and Corporation of the City. Her Majesty's Judges have consented to arrange the Nisi Prius sittings during Trinity term so as to leave the Courts free for the week of the meeting. All the Departments will therefore meet in the morning of each day at Guildhall.

The use of the west wing of Burlington-house has been granted by the Royal Society and the University of London. The Philanthropic Congress will hold its morning sittings in the Hall; and that room, and the ante-room, will be used by the Association for its Evening Discussions.

The Palace at Westminster has been granted by the First Commissioner of Public Works and the Commissioners of Woods and Forests, for a Soirée on the evening of Saturday, the 7th of June.

The opening meeting of the Association will be held on the evening of Thursday, June 5th, at 8.30 p.m., in Exeter-hall. The President will deliver his address, and other distinguished persons will take part in the proceedings.

The meetings of the Departments will be held, from Friday the 6th to Friday the 13th, both inclusive, at the Guildhall, from 11 a.m. to 4 p.m.

The meetings of the Congress will be held on Monday, June 9th, and following days, at 11 a.m., in Burlington-house.

Evening Discussions, on subjects of special interest, will be held at Burlington-house, at 8.30 p.m., on Friday the 6th, Monday the 9th, Tuesday the 10th, and, if convenient, on other evenings.

The Royal College of Physicians will receive the Officers and Council of the association, and the leading foreign members, at a soirée, on the evening of Monday, the 9th of June.

The Reformatory and Refuge Union will give a soirée to the members and ladies of the Association and Congress, at the Hanover-square Rooms, on the evening of Tuesday, the 10th of June.

The proceedings of the week are:—

Thursday, June 5th—Opening meeting of the Association, in Exeter Hall, at 8.30 p.m. The President delivered his address.

Friday, June 6th—The departments meet in Guildhall, at 11 a.m., for the reading of papers and Discussion. Evening Discussions at Burlington-house, at 8.30 p.m.

Saturday, June 7th—The Departments meet in Guildhall, at 11 a.m. Soirée at the Palace of Westminster at 9 p.m.

Monday, June 9th—The Departments meet in Guildhall, at 11 a.m. The Congress will meet in Burlington-house at 11 a.m.; the President will deliver his address.

Evening Discussions at Burlington-house, at 8.30 p.m. Soirée at the Royal College of Physicians.

Tuesday, June 10th.—The Departments will meet in Guildhall, at 11 a.m. Annual Meeting of the Ladies' Sanitary Association, in the Public Health Department, at 2 p.m.; the Lord Mayor in the chair. The Congress will meet in Burlington-house, at 11 a.m. Evening Discussions in Burlington-house, at 8·30 p.m. Soirée at the Hanover-square Rooms, by the Reformatory and Refuge Union.

Wednesday, June 11th.—The Departments will meet in Guildhall, at 11 a.m. The Congress will meet in Burlington-house, at 11 a.m. Evening Discussions at Burlington-house, at 8·30 p.m.

Thursday, June 12.—The Departments will meet in Guildhall, at 11 a.m. The Congress will meet in Burlington-house, at 11 a.m. Evening Discussions at Burlington-house, at 8·30 p.m.

Friday, June 13th—The Departments will meet in Guildhall, at 11 a.m. The Congress will meet in Burlington-house, at 11 a.m. Concluding Meeting of the Association in Burlington-house, at 8·30 p.m.

Saturday, June 14th.—Dinner at the Crystal Palace, Sydenham.

For the purpose of receiving personal communications, the Executive Committee sit at 3 o'clock, at the Office, 12, Old Bond street, W., on Mondays, Wednesday, Fridays, and Saturdays; and at the same hour at the City Office, Guildhall, E.C., on Tuesdays and Thursdays.

All communications concerning papers or other business of the meeting, must be addressed to the Executive Committee, 12, Old Bond-street, W.

The following are the Officers and Committee of the Congress:—Secretaries—Thomas Twining, Esq.; James T. Hammack, Esq. Committee of Organisation—Henry Roberts, Esq., F.S.A., Chairman; W. Farr, M.D., F.R.S.; James T. Hammack, Esq.; Major-General Sir Joshua Jebb, K.C.B.; Samuel Redgrave, Esq.; John Simon, Esq., F.R.S.; and Thomas Twining, Esq.

The regulations concerning papers are as follows:—

Every paper must be sent to the Executive Committee. On the first page of every paper must be written the subject, the name of the author, and his address. The Council reserve the right of rejecting any paper which they consider inappropriate. No paper must occupy in reading more than twenty minutes. No paper already published can be read. No paper, when read, can be published by the author (unless by permission of the Council) previous to the publication of the Transactions of the Association for 1862. The Council may print any paper, either in whole, or in part, or may exclude it from the Transactions, as they see fit.

THE WEAR OF SILVER COINS.*

The following Statement shows the results of some Experiments made upon a large number of Silver Coins, by Mr. William Miller, first Assistant-Cashier of the Bank of England. Of these 169,000 were examined singly, with the view of ascertaining the present condition of the Silver Circulation, and the loss by year. It should be remembered that the average loss by wear in a century, given in the Table, is founded upon the wear which the several coinages have undergone up to the present time; but as the rate at which a coin wears is an increasing rate, it is obvious that the actual loss in a century would be much greater than that here given:—

	Amount Coined since 1816.		Withdrawn from Circulation.	Remaining in Circulation.	Average of Loss by wear in 100 years at the rate at which the Coinage of the several reigns have worn, up to the present time.	Loss by wear on Amount withdrawn.	Loss by wear on Amount in Circulation.	Number of Coins examined singly.
		£	£	£	Per Centage.	£	£	
CROWNS	Victoria......	117,414	...	117,414	5.50	...	15,776	4,000
	William IV..	...	...	...	...			
	George IV...	140,726	...	140,726	7.04			
	George III...	321,750	...	321,750	7.46			
HALF-CROWNS.	Victoria......	1,043,251	...	1,043,251	14.17	13,546	250,270	20,000
	William IV..	380,556	...	380,556	15.30			
	George IV...	1,113,848	...	1,113,848	15.80			
	George III...	2,387,088	252,870	2,134,218	15.92			
FLORINS	Victoria......	1,541,161	...	1,541,161	15.	...	10,147	5,000
SHILLINGS	Victoria......	2,609,504	490	2,609,014	26.55	167,684	413,044	80,000
	William IV..	412,038	49,944	362,094	26.82			
	George IV...	878,922	350,622	528,300	28.74			
	George III...	3,304,224	867,674	2,436,550	29.96			
SIXPENCES	Victoria......	1,182,339	298	1,182,041	37.	72,420	221,380	60,000
	William IV..	281,994	34,614	247,380	39.			
	George IV...	81,378	47,738	33,640	44.8			
	George III...	919,314	312,250	607,064	45.			
		16,715,507	1,916,500	14,799,007			910,617	
						253,650	253,650	
							1,164,267	Total loss by wear.

(Signed) W. MILLER.

Bank of England, December, 1860.

---

* See also *Journal*, Vol. viii., p. 739.

ROLLER SKIDS FOR BOATS.

There are doubtless few persons that reside on, or have visited our coasts, who have not frequently watched with interest the picturesque groups of fishermen and other boatmen hauling up their boats, and observed the contrivances by which that often laborious operation is made more easy of accomplishment—varying according to the size of the boat, the character of the beach, or mere local custom.

At one place—as at Deal or Hastings, with their steep shingle beaches, large boats, and numerous bodies of boatmen—will be seen the long row of powerful capstans, by the aid of which the large decked or half-decked smack, hovelling boat, or trawler, is hauled up with comparative ease, yet seemingly reluctant to leave her native element, in which her weight is nothing, and in which she lives and moves, to hibernate, as it were, for a time with suspended life and animation, motionless on the land. There, also, it will have been observed that long flat boards of hard wood, with their upper surface greased, are placed under the boats when hauling up or launching, so as to reduce as much as possible the friction as they are dragged along.

At another place, as at Great Yarmouth or Lowestoft, with a flatter and sandy shore, their long and graceful yawls and smaller craft are, for the most part, hauled up by hand alone, the numerous boatmen being banded together in companies, and mutually assisting each other in the operation. Here the friction of hauling up is lessened by employing small portable machines, consisting of a strong wooden frame with two or three iron rollers fixed in it, which is traversed by the boat's keel, she being held in an upright position by men at her sides.

Again, farther north, on the still flatter sands of Northumberland, Durham, and Yorkshire, where the three-keeled and graceful coble abounds, the fishermen, often aided by their wives and daughters, will be seen lifting them on the little wooden trucks, on which they are wheeled along on the hard and level strand.

Annexed are wood cuts of the "roller-skids" used by the Norfolk and Suffolk boatmen in hauling up their larger boats, and which have been adopted by the National Life-boat Institution, and found valuable auxiliaries in hauling up its life-boats, saving much labour, trouble, and expense. There are three varieties of these skids used by the life-boats of the Institution—one is the simple wooden frame with either two or three rollers in it (Fig. 1), which is sufficient on hard ground, moveable short boards being placed under it transversely where the beach is soft. A second (Fig. 2) is similar, but having its sleepers attached

FIG. 1.

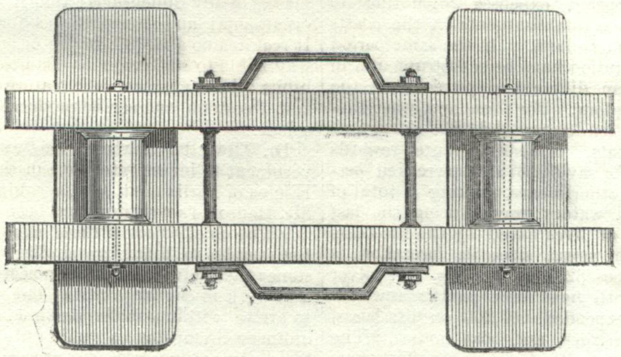


FIG. 2.

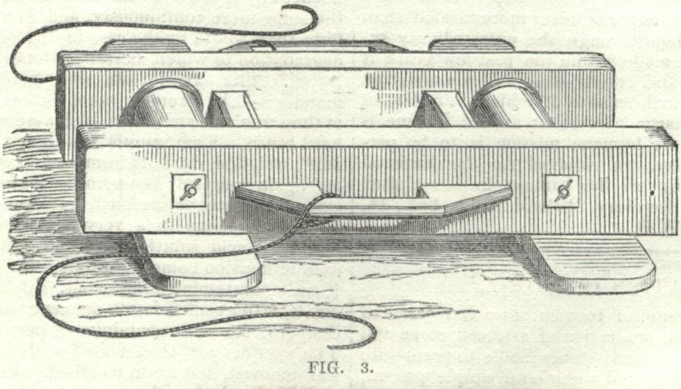
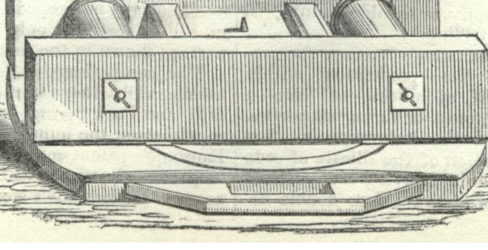


FIG. 3.



to it beneath the rollers, which form is most convenient for placing under a boat whilst she is still in the water. Much labour is saved by hauling a heavy boat on the rollers whilst she is still partly water-borne, and it is awkward to place a detached board under a skid in the water, especially when the boat has much motion from the surf. A skid of this description can, by means of two short lines attached to it, as shown in the figure, be readily hauled under the stem or sternpost of a boat by two men or lads, one dragging by each line. These lines should be of Manilla rope, which will float, and thus indicate the position of the skid when under water. Two-inch rope will be found a convenient size.

A third variety (Fig. 3) is a shorter skid, similar to the above, fitted to turn on a pivot-bolt fixed in a flat piece of wood, thus forming a portable turn-table, on which a boat, when hauled over it, can be turned round with very small power in any direction. The life-boats of the Institution are supplied with one of these turntables, with two of the second variety, or water-skids, for use in the water, and with two of the plain skips with detached sleepers. A less number would, however, be sufficient for ordinary use, unless for very large and heavy boats; and they are strongly recommended to the attention of the boatmen on those parts of the coast where they are not already employed.

During the past two years (1860-61), the National Life-boat Institution has incurred expenses amounting to £22,650 on various life-boat establishments on the coasts of England, Scotland, and Ireland. In the same period the life-boats of the Institution have been instrumental in rescuing 500 persons from different shipwrecks on the coasts of the United Kingdom. For these and other life-boat services, the Institution has voted £1,893 as rewards to the crews of the life-boats. It has also granted rewards amounting to £515 10s. for saving 373 shipwrecked persons by shore-boats and other means, making a total of 871 persons saved from a watery grave during the last two years. The number of lives saved by the life-boats of the Society and other means since its formation, is 12,293, for which services 82 gold medals, 704 silver medals, and £15,250 in cash have been paid in rewards. The Institution has also expended £57,200 on life-boats, life-boat transporting carriages, and boat houses. The public cannot but sympathise with the vigorous efforts now being made by this Institution to save the lives of shipwrecked crews. Their help was never more needed than at the present time, when, through the extraordinary exertions the Society has made within the past few years, it has now one hundred and twenty-one life-boats under its management, for the maintenance of which, in a state of thorough efficiency, a large permanent annual income is absolutely needed, if its humane mission is to be perpetuated. Contributions are received for the National Life-boat Institution by all the bankers in the United Kingdom, and by the Secretary, Richard Lewis, Esq., 14, John-street, Adelphi, W.C.

INDURATION OF STONE.

Mr. Frederic Ransome, of Ipswich, who has patented several processes for the production of artificial stone and for the preservation of natural stones liable to premature decay, has recently discovered a new and simple process, by which it is stated that some of the commonest and most abundant natural materials may be combined and formed into solid blocks of masonry, or moulded into works of art, at a cost comparatively trifling.

The peculiarity of Mr. Ransome's process for preserving stone consists in the production within the pores of the stone itself of silicate of lime—a substance which possesses the most enduring properties. He has hitherto accomplished the induration by first saturating the stone with a solution of the silicate of soda (soluble glass), and by afterwards applying a solution of chloride of calcium (muriate of lime). Here double decomposition takes place, the silica combining with the calcium to form a solid silicate of lime, and the chlorine at the same time combining with the soda, forming chloride of sodium or common salt, which is removed by subsequent washings or otherwise. It was in noticing the enormous cohesive properties exhibited by the silicate of lime thus produced that Mr. Ransome was led to investigate the applicability of that material as an essential ingredient in the manufacture of stone itself, and the results of his experiments have been patented. The new process consists in mixing common sand, chalk, or other suitable mineral substances with a solution of silicate of soda into such a consistence that the mixture can be easily moulded into blocks or any other forms, rolled into sheets or slabs, or applied with a trowel as ordinary cement. Afterwards a solution of calcium is applied by means of a brush or by immersion, as may be most convenient. The patentee states that the effect is instantaneous, the material being immediately converted from a soft soluble substance into a hard insoluble compound, capable of resisting the influences of the most deleterious atmospheres, and possessing the property of gradually increasing in hardness with the lapse of time.

Amongst the advantages of this process it may be mentioned that the stone can in most cases be manufactured upon the spot, from materials obtained in the locality; that it can be moulded into any form or made in masses of any dimensions; that it is equally available for ornamental and decorative as for constructive purposes. It requires no artificial drying or burning, while it is in no way liable to shrinkage or distortion of any kind. It exhibits all the characteristic features and appearance of the best freestone, and can be produced of any desired tone of colour.

Dr. Edward Frankland, who was appointed by the Government to investigate the causes of decay of the new Houses of Parliament, says, speaking of the tests to which Mr. Ransome's new stone has been subjected:—

"The chief object of these experiments was to expose the samples to influences similar to those to which the stones themselves would be subjected, when used for outside work in our large cities; but in order as far as possible to arrive, within a moderate time, at results which under ordinary circumstances would only be obtained after the lapse of many years, it was necessary to intensity those influences by presenting the various chemical re-agents to the stone more continuously, and in a more concentrated form than would be the case in the ordinary atmospheric degradation to which building stones are exposed. . . . . The experiments were made in the following manner:—The samples were cut as nearly as possible of the same size and shape, and were well brushed with a hard brush. Each sample was then thoroughly dried at 212°, weighed, partially immersed in water until saturated, and again weighed; the porosity or absorptive power of the stone was thus determined. It was then suspended for forty-eight hours in a very large volume of each of the following acid solutions, the alteration in weight after each immersion being separately estimated. Solution No. 1, water containing 1 per cent. sulphuric acid; solution No. 2, water containing 2 per cent. sulphuric acid; solution No. 3, water containing 4 per cent. sulphuric acid. The sample was then boiled with water until all acid was removed, and again weighed. Finally, it was dried at 212°, brushed with a hard brush, and the total degradation or loss since the first brushing was ascertained."

There was no loss with 2 per cent. or with 4 per cent. of dilute acid, and only the fractional portion of a single part, as shown in the total of degradation from all causes.

The comparisons in Dr. Frankland's table of experiments, whilst they point out the Portland, Whitby, Hare Hill, and Park Spring, as the natural stones best adapted to withstand the influences of town atmospheres, indicate Ransome's patent concrete as equal to the best of these in its power of resisting atmospheric degradation; and the newness of Ransome's stone (the specimens experimented upon not having been made a fortnight) being taken into account, together with the fact that its binding material, silicate of lime, becomes harder and more crystalline by age, having led Dr. Frankland to express the opinion that it is likely "Mr. Ransome has invented a material which, with the exception of the granites and primary rocks, is better capable of giving permanency to external architectural decorations than any stone that has been hitherto used."

Name of Stone.	Porosity percentage of water absorbed by dry stone.	Percentage Alteration in Weight by Immersion in dilute Acid.						Total percentage loss by action of acid and subsequent boiling in water.	Further loss by brushing.	Total degradation from all causes.
		Of 1 per cent.		Of 2 per cent.		Of 4 per cent.				
		Loss.	Gain.	Loss.	Gain.	Loss.	Gain.			
Bath....................	11·57	1·28	—	2.82	—	2·05	—	5·91	·26	6·17
Caen	9·86	2·13	—	4·80	—	·67	—	11·73	1·60	13.33
Aubigny	4·15	1·18	—	4·00	—	—	1·04	3 56	·29	3·85
Portland	8·86	1·60	—	1·10	—	1·35	—	3·94	·24	4·18
Anston..................	6·09	3·52	—	3·39	—	3·11	—	11·11	·27	11·38
Whitby	8·41	1·07	—	—	·53	none.	none.	1·25	·18	1·43
Hare Hill	4·31	·75	—	—	·60	none.	none.	·98	·15	1·13
Park Spring	4·15	·71	—	—	·10	15	—	·81	none.	·81
Ransome's Patent ...	6·53	—	·95	none.	none.	none.	none.	·63	·31	·94

Mr. Ransome it still engaged in further experiments with this artificial stone, as to its powers to support a crushing weight, and to sustain strains under varying conditions.

Proceedings of Institutions.

◆

Hastings Mechanics' Institution.—The report laid be-before the annual meeting, held May 7th, says:—The lecture session just concluded is the most important feature of this year's operations. The following is a list of the lectures delivered:—"Remains of Extinct Animals," B. W. Hawkins, Esq.; "Literary Reading," R. Butler, Esq.; "School of Nature," Dr. Moore; "The Moon," Rev. T. Harding; "Poets in Action," J. Saunders, Esq.; "The Honey Bee," Dr. Hale; "The Poetry of Wordsworth," Rev. R. W. Jones; "Daniel Defoe," G. Dawson, Esq.; "Trade of Israel on the Red Sea," S. Sharpe, Esq.; "Washington and his Times," W. D. Lucas-Shadwell, Esq.; "Julius Cæsar," Mr. T. Edwards; "Oxy-Hydrogen Microscope," J. Kilburn, Esq.; "Napoleon the First," E. Harcourt, Esq.; "Useful Plants," Mr. W. King; "The Arctic Regions," J. G. Fitch, Esq.; "George Stephenson," Mrs. Balfour; "Comets," Rev. T. Harding; "The Pulpit, the Bar, and the Press," Rev. J. C. Fishbourne. The Committee regret to state that the serious illness of F. North, Esq., M.P., prevented him from favouring the members with a promised lecture on "Republics; Ancient, and Modern." The Committee feel much indebted to to the gentlemen who so readily gave their time and talents for the benefit of the Institution. The lectures were all well attended. The receipts of the lectures were £14 18s. 9d., and the expenditure £30 10s. 6d., so that the average cost of each lecture was 17s. 1d. During the past quarter the number of persons elected members was 9, and the number who declined 63; the present number is 312. During the whole year 137 have joined the Institution, and 151 have left. During the past quarter 653 books have been in circulation. The volumes issued during the year have been 2,050. The Committee feel some doubt as to whether it would be advisable to subscribe to some London library, so as to procure a constant supply of new books. After giving the question due consideration, they have decided that it would be better to spend any surplus funds they may have at their disposal in additions to the library, rather than adopt such course. They have thus been enabled to purchase 33 volumes of new books, which are eagerly sought after by the members. The reading-room is well supplied with daily and weekly papers and periodicals, and is much frequented by the members. The income for the past year was £191 18s. 8d., and the expenditure £181 8s. 1d. The Institution begins the year with not a debt unpaid. The subject of classes is one that the Committee cannot report upon as favourably as they could wish. The partition for forming the class-room is perfect in its workings, but students are not forthcoming to fill the classes. Mons. Petitfourt, at the commencement of the session, offered to take charge of a French class, and the class was formed, but in a few weeks it was discontinued for the want of members. It is a source of deep regret that the young men amongst the members should not appreciate the first-class instruction they would receive in the study of a language that is now so much spoken. A class for English grammar has been carried on through the winter under Mr. T. Edwards; and although the Superintendent was very energetic, and used every means in his power to induce young men to join, but two or three met each evening. A writing class has met on Wednesday evenings, under the superintendence of Mr. Avery, but the average attendance at that class has been no more than five. An arithmetic class, conducted by Mr. F. Womersley, has met on Thursday evenings; the average attendance at this class has been four. The superintendents of these classes, however, report that, although the attendance is small, the progress made by the students is satisfactory; and that the superintendents are not discouraged, but will, with the return of autumn, have great pleasure in being as useful as they can to the Institution. A discussion having arisen at the last quarterly meeting, as to the advisability of subscribing to the National Fund for erecting a Monument to the late Prince Concert, a motion was carried recommending the Committee to prepare subscription-lists for the members. The Committee duly considered the recommendation, but a Local Memorial Fund being then about to be raised, they thought it would not be just to interfere with that effort, especially as it appeared probable that the members of the Institution would subscribe to the Local Fund in preference to forwarding their subscriptions to the Society of Arts for the National Memorial. The Committee also felt that they should not like to see the Hastings Institution represented by a small amount; on these grounds they decided to let the matter rest. In concluding the report the Committee congratulate the members on the continued prosperity of the Institution.

Royston Institute.—The last report states that the Committee regret that, during the past year, they experienced great difficulties, which compelled them in the latter portion of the year to abstain from all but absolutely necessary expenses; and they rejoice to report that by exercising a sound economy they can now show a more favourable result at the close of the year than they at one time anticipated. It is difficult to account for any decline in the support given to the Institute. Until the past quarter (when the number of members was increasing through the attraction of the classes) the members subscribing to the reading-room were considerably less than in 1860. Possibly the attractions of the reading-room were not so great through the cheapness of newspapers, which are now within the reach of the poorest member of society. The total expenditure last year was £54 19s.; this sum added to the debt at the commencement of the year, gives a total of £62 19s. 3½d.; but the income was only £61 17s. 9d½., still leaving a deficiency of £1 1s. 6d. The members and subscribers of 1861 were:—32 life members, 2 honorary members, 140 ordinary members, 52 admitted to the lectures by means of family tickets, 2 subscribers for the lectures only, and 14 for the reading-room alone—total 242, being one less than in the previous year. The total sum subscribed, however, was about £5 less. Of the ordinary members 65 belonged to the class of mechanics, domestic servants, and young persons—an increase of 2 on the previous year. Eight lectures and entertainments were given during the year, to which free admission was granted:—On "George Stephenson" (gratuitous), Rev. E. Wrenford; "Charlotte Bronte," Mrs. Balfour; "A Musical Entertainment," Mr. and Mrs. Cooper; "Human Hand" (gratuitous), Dr. Humphry, of Cambridge; "Acoustics," Mr. Wheeler; "The Earth's Magnetism and the Sun's Spots," Mr. Hunt; "Africa" (two, gratuitous), Rev. W. Monk. The members were also admitted at half-price to an "Oration" by Mr. Langdon Davies. The meeting for competitive trials of skill in the games of chess and draughts was presided over by the Rev. H. W. Hodgson, of Ashwell. Fourteen volumes of books were purchased and added to the library, through the liberality of Joseph Beldam, Esq. Members making use of the library were 97; evenings for issuing books, 52; volumes issued, 1,933; volumes renewed, 669—total number of volumes, 2,602—average each evening, 50. Ninety members subscribed to the reading-room during the year. The classes formed last October have been highly successful. The Committee feel deeply indebted to the Rev. R. Shaen and Mr. Isaac Beale for their liberality in conducting them.

MEETINGS FOR THE ENSUING WEEK.

Mon......R. Geographical, 8½.
Tues. ...Medical and Chirurgical, 8½.
Zoological, 9.
Syro-Egyptian, 7½. Rev. Basil H. Cooper, "On the Dated Greek Proscynemata, found in Egypt; with especial reference to a hitherto unobserved phenomenon relating to them.
Royal Inst., 4. Rev. G. Butler, "On the Art of the Last Century."
Wed. ...Microscopical. 8.
Literary Fund, 3.
Royal Soc. of Literature, 8½.
Archæological Assoc., 8½.
Thurs...Philological, 8.
Royal Inst., 3. Dr. Lyon Playfair, "On the Progress of Chemical Arts (1851-1862)."
Fri.......Astronomical, 8.
Royal Inst., 8. Sir Henry Rawlinson, "On Cuneiform Writing and the way to read it."
Sat.......Royal Botanic, 3¾.
Royal Inst., 3. Dr. T. Anderson, "On Agricultural Chemistry."

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Delivered on 7th May, 1862.

Par Numb.
206. Postal Service (Kingstown)—Returns.
161. Cadastral Survey—Report from Committee.

Session 1861.

324 (A xi.) Poor Rates and Pauperism—Return (A).

Delivered on 8th May, 1862.

167. Civil Contingencies—Account.
194. Lunatics—Return.
197. Fire Engines, etc. (Bills of Mortality)—Return.
201. Game Laws, etc. and Game Laws—Returns.
208. Army (Effectives)—Return.
211. Railway and Canal Bills Committee—Sixth Report.
205. Agricultural Statistics—Return.
100. Bill—Public Works and Harbours Act Amendment.

Delivered on 9th May, 1862.

188. Cunard Mail Steamers—Returns.
191. Registry of Deeds Office (Dublin)—Return.
207. Sugar Duties—Return.
98. Bills—Merchandise Marks (as amended by the Select Committee.)
101. Bills—Transfer of Land.
102. „ Declaration of Title.
103. „ Security of Purchasers.
104. „ Real Property (Title of Purchasers).
United States (Political Arrests)—Extract of a Despatch.

Delivered on 10th and 12th May, 1862.

140. Post Office Savings Banks—Account of Deposits, etc.
203. Post Office Savings Banks—Returns.
217. Merchant Seamen's Fund—Account.
221. Fires in the Metropolis—Report from Committee.
105. Bill—Landed Property Improvement (Ireland) Acts Amendment.
Rebellion in China, and Trade in the Yang-Tse-Kiang River—Papers.

Delivered on 13th May, 1862.

183. Mines—Return.
225. Poor Relief (Lancashire, etc.)—Return.
Births, Deaths, and Marriages in England—Twenty third Annual Report of the Registrar General.

Delivered on 14th May, 1862.

209. Canada (Halifax, etc. Railway)—Copy of Memorials.
216. East India (Army)—Return.
218. Seamen's Savings Banks—Account.
219. Mercantile Marine Fund—Account.
222. Education Grants—Correspondence.
223. County Treasurers (Ireland)—Account.
224. Lanelly, etc., Schools—Correspondence.
202. Landed Estates Court (Ireland)—Returns (a corrected Copy).
106. Bills—Peace Preservation (Ireland).
107. „ Poor Law Officers' Superannuations (Ireland).
108. „ British Museum.
109. „ Customs and Inland Revenue (amended).
110. „ Discharged Prisoners' Aid.
112. „ Retiring Pay, etc. British Forces (India).

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, May 23rd*, 1862.]

Dated 13th May, 1862.

1436. J. B. Sardy, London—Imp. in the construction of ships of war and other vessels.
1438. A. Wormull, Old Fish street—Imp. in trepanning instruments.
1440. J. H. Johnson, 47, Lincoln's inn-fields—Imp. in the purification of colza, rape, and other oils. (A com.)
1442. J. Sivewright, Ravenhead, St. Helen's, Lancashire—Imp. in the manufacture of polished plate glass.
1446. R. A. Brooman, 166, Fleet-street—Imp. in louvre blinds or shutters. (A com.)

Dated 14th May, 1862.

1450. C. T. Porter, 100, Fleet-street—Imp. in steam-engine indicators. (A com.)
1452. F. Tolhausen, 100, Fleet-street—Imp. in the manufacture of velvets. (A com.)
1456. A. Smith, Mauchline, N.B.—Imp. in balances for weighing letters and other documents.
1458. H. G. Delvigne, 26, Rue St. Dominique, Paris—Imp. in fire arms.
1460. J. C. Brant, 69, Forston-street, City-road-basin—Imp. in the construction of armour-plated ships, and in cements or compositions for uniting iron to iron, and for uniting other substances, which compositions may also be used for caulking and for coating ships' bottoms.

Dated 15th May, 1862.

1462. J. Fletcher and J. W. Fuller, Salford—Imp. in machinery for rolling, bending, and planing metals.
1464. G. H. Sanborn, 100, Fleet-street—Imp. in machinery for spinning. (A com.)
1466. J. P. Jouvin, Rochefort-sur-Mer, France—An improved process for preserving iron-plated and other vessels and metallic articles from oxidation, and preventing ships' bottoms from fouling.
1468. W. Sissons, Kingston-upon-Hull—Imp. in machinery for driving piles by means of steam hammers.
1470. J. Stone, High-street, Deptford—Imp. in Downton's ship bilge pump and fire engines.
1472. J. Wright, 42, Bridge-street, Blackfriars—Imp. in machinery for digging, excavating, and removing earth, gravel, and such like substances. (A com.)
1474. C. Tress, Blackfriars-road—Imp. in the manufacture of hats, helmets, bonnets, or caps.

[*From Gazette, May* 30*th*, 1862.]

Dated 8*th April*, 1862.

1001. H. A. Holden, Birmingham, and C. Weekes, Carmarthen—Imp. in apparatus used in drawing water or other fluids from cisterns, tanks, or other vessels.

Dated 16*th April*, 1862.

1110. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in machinery or apparatus for cutting the teeth of wheels, racks, or segments. (A com.)

Dated 19*th April*, 1862.

1143. W. Munn and D. Ballantine, jun., Borrowstounness, Linlithgow, N.B.—Imp. in mills for grinding.

Dated 21*st April*, 1862.

1163. A. Dixon, Birmingham—Imp. in knife and fork cleaning machines.

Dated 23*rd April*, 1862.

1187. A. V. Newton, 66, Chancery-lane—Imp. in looms for manufacturing tufted pile fabrics, and in the mode of operating such looms. (A com.)

Dated 25*th April*, 1862.

1211. P. R. Drummond, Perth, N.B.—A revolving rake for lifting objects from the ground.

Dated 30*th April*, 1862.

1264. E. Moore, Tewkesbury—Imp. in the manufacture of dress shirts and dresses.

1265. A. Travis and B. Travis, Dukinfield—Imp. in engines for carding cotton and other fibrous materials.

1267. J. Harrington and T. Perkins, Birmingham—An imp. or imps. in mounting photographic portraits for visiting cards, and in mounting photographs in general.

1269. G. Davies, 1, Serle-street, Lincoln's-inn—Imp. in the manufacture of nails, screws, and other analogous articles in malleable cast iron. (A com.)

1271. J. Maiden, Waterloo, near Ashton-under-Lyne—Imp. in safety lamps.

1273. T. Piatti, 76, Rue St. Louis au Batignolles, Paris—Imp. in the propulsion of ships and other vessels, and in the means and apparatus employed for this purpose.

1275. J. Oxley, Garden-street, Sheffield—Imp. in apparatus for cutting and chopping bread and other substances.

1277. J. M. Carter, Monmouth—Imp. in harness and the shafts of carriages.

1279. W. Staufen, George-street, Portman-square—A new material to be used in the manufacture of brushes, and also applicable to the purposes for which bristles, horse hair, and human hair are now used.

1281. J. M. Napier, York-road, Lambeth—Imp. in machinery for manufacturing projectiles.

1283. H. F. Broadwood, Great Pulteney-street—Imp. in the construction of pianofortes.

1285. W. E. Newton, 66, Chancery-lane—Imp. in lamps. (A com.)

Dated 1*st May*, 1862.

1287. J. Swallow and J. Allinson, Heckmondwike—Imp. in the manufacture of carpet fabric.

1289. C. P. A. Douchain, St. Cloud, France—Imp. in apparatus for letting in or shutting off water or other liquids.

Dated 2*nd May*, 1862.

1291. W. Huntingdon and T. Huntingdon, Victoria Mills, Liverpool—Imp. in the machinery for the manufacture of bread.

1292. H. Kohn, 29, Unter den Linden, Berlin—A new method of making any kind of stuffs, textures, or fabrics waterproof.

1293. W. Bodden and W. Mercer, Oldham—Imp. in certain parts of machinery for slubbing and roving cotton and other fibrous substances.

1295. R. Walker, Glasgow—Imp. in malting, and in apparatus therefor.

1297. O. C. Evans, 20, Church-street, Old Kent-road—An abdominal truss intended for the more perfect support and cure of hernia.

1301. M. Paul Dumbarton—Imp. in windlasses and capstans, or ship's winding apparatus.

1303. H. Welch, Millwall—Imp. in securing or attaching armour plates on or to ships or vessels.

Dated 3*rd May*, 1862.

1305. W. Mossman, 1, Cleveland-terrace, Gloucester-road, Islington—Imp. in the manufacture of bonnets, hats, or coverings for the head.

1309. E. Omerod and C. Schiele, Manchester—Imp. in machinery or apparatus for cutting or dressing stones, which are also applicable for hammering, crushing, or otherwise reducing metals and other materials.

1311. J. M. Herdevin and J. A. Jullien, 13, Rue Gaillon, Paris—Imp in sluice cocks.

1313. J. M. Heppel, 34, Great George-street, Westminster—Imp. in the construction of the permanent way of railways.

1315. W. Black, Wood-street, Northampton—Imp. in lottery or ballot boxes.

1317. M. Henry, 84, Fleet-street—Imp. in the process of and apparatus for preparing materials for the manufacture of paper, and in obtaining products from agents used in the said process, part of the invention being also applicable to apparatus for washing. (A com.)

1319. S. Merolla, Lago Castello, No. 75, Naples—Imp. in fire-arms.

1321. J. Mellodew and T. Mellodew, Moorside Mills, Oldham, and C. W. Kesselmeyer, Manchester—Imp. in looms for weaving.

1323. J. Heyworth, Shawforth, near Rochdale—Imp. in looms for weaving.

Dated 5*th May*, 1862.

1325. A. Williams, New Windsor—The construction of a backed form or seat capable of being converted into a level table with seat or a desk either level or sloping or at any angle.

1327. L. G. Perreaux, Paris—Certain imp. in clocks or machines for keeping time.

1331. T. F. R. Brindley, 2, Leonard-square, Finsbury—Imp. in travelling and other flasks, decanters, bottles, and other necked vessels.

1334. J. Victor, Wadebridge, J. Polglase, Bodmin, and W. Rounsevell, St. Breok, near Wadebridge, Cornwall—Imp. in the manufacture of safety fuses for mining and other purposes.

1335. R. Burley, Glasgow—Improved arrangements for using ordnance under water, and in part applicable otherwise.

1337. J. Roscoe, Bell-lane, Leicester—An improved lubricator for steam engines.

1339. E. B. Wilson, 5, Parliament-street, Westminster—An imp. in the machinery or apparatus used in the manufacture of malleable iron and steel.

1341. J. Adcock, Marlborough-road, Dalston—Improved apparatus for measuring and indicating distances travelled by wheel carriages.

Dated 6*th May*, 1862.

1343. T. Cabourg, 333, Rue St. Martin, Paris—Imp. in machines for the purpose of uniting together by means of screws leather used in the manufacture of boots and shoes, and other articles composed of two or more pieces of leather.

1345. A. Morel, Roubaix, France—Imp. in heckling machines.

1346. G. Borthwick, Bedford, near Leigh, Lancashire—Certain imp. in the construction of ships, boats, and rafts.

1347. P. Chenailleur, Paris—Imp. in apparatus for concentrating liquids, or for condensing alcoholic or other vapours.

1349. W. Richard and J. Richard, Edinburgh—Imp. in the manufacture of printing types, spaces, and quadrats.

1351. W. Greaves, 11, Portland-street, Poland-street, Soho—Imp. in safety stirrup bars.

1353. W. Clark, 53, Chancery-lane—An improved buckle or fastening. (A com.)

1355. J. E. Ransome, W. Copping, and L. Lansdell, Ipswich—Imp. in harrows.

Dated 7*th May*, 1862.

1356. W. E. Nethersole, Swansea—Imp. in parts of railway trucks and waggons, parts of which are applicable to railway carriages.

1359. C. V. F. De Berville, 72, Rue Blanche, Paris—An improved safety coupling bar for locomotives and other railway carriages.

1363. C. Clark, 361, City-road—An improved cigar tube.

1365. J. Johnson and A. Chapman, Leatherhead, Surrey—Imp. in apparatus for preventing collisions on railways.

1367. R. A. Brooman, 166, Fleet-street—Imp. in swings. (A com.)

1369. G. T. Bousfield, Loughborough-park, Brixton—Imp. in applying steam power to tilling land by means of a digging locomotive. (A com.)

1371. W. Gossage, Widness, Lancashire—Certain improved apparatus to be used in the manufacture of soap.

1373. J. McCann, Dublin—Imp. in the mode of, and apparatus for, drying, cooling, and cleaning grain.

Dated 9*th May*, 1862.

1375. W. P. Gaulton and M. Booth, Manchester—Imp. in apparatus or machinery for damping and steaming fabrics, part of which imp. are applicable for distributing fluids for other purposes.

1379. J. Fowler, Leeds, and J. King, Chadshunt, Warwickshire—Imp. in apparatus for tilling land by steam power.

1381. C. Langley, Deptford—Imp. in apparatus for manœuvring ships and vessels.

1383. A. P. Price, 47, Lincoln's-inn-fields—Imp. in straps or bands for securing articles, parcels, or luggage.

1385. L. De la Peyrouse, 13, Panton-square—Imp. in treating neutral and acid, fatty, or oily substances, resins and resinous substances, and compounds or products containing paraffine.

Dated 9*th May*, 1862.

1393. Captain J. F. Bland, Dorset-square—An improved method of, and apparatus for, signalling between targets and shooters.

1395. J. Oxley, Frome—Imp. in apparatus for facilitating the processes of mashing and sparging in breweries aud distilleries.

1397. N. Symonds, 6, Cambridge-street, St. Pancras—Imp. of all kinds of wheels, framework, girders, columns, and stancheons, blades of blowing fans, and paddle-wheels for steam-vessels.

1399. Captain F. J. Bolton, Bolton-row, May Fair—An improved mode of, and apparatus for, displaying the lights in light houses.

Dated 10*th May*, 1862.

1400. G. C. Haseler, 19, Vittoria-street, Birmingham—Imp. in the manufacture of lockets, and of a new application of Parkesine as a substitute for glass in the construction of lockets and other articles of jewellery.

1401. J. G. Willans, 2, Clarence-place, Belfast—Imp. in the treatment of the product from iron blast furnaces (whether moulded or otherwise) usually termed pig or cast iron or castings.

1403. W. Clark, 53, Chancery-lane—The application of a vegetable fibre alone or in combination with other matters in the manufacture of felted and other fabrics, also as a substitute for flock or powdered wool, and as a material for padding or stuffing and for other useful purposes. (A com.)
1405. R. Moore, Cannon-street West—Imp. in the structure and appliances of ships and other vessels.
1407. R. Willoughby, Mildmay-road - Improved apparatus for exhibiting and giving rotatory and traversing motion to placards, advertisements, scenes, and other objects.
1409. J. House, Market Lavington, Wiltshire—Imp. in machinery or apparatus for crushing or reducing substances.
1411. E. Kolbenheyer, Vienna, Austria—An improved apparatus for making ices and cold beverages.
1413. W. Clark, 53, Chancery-lane - Imp. in lamps, and in apparatus for filling lamps with oil or fluid to be consumed. (A com.)

Dated 12th May, 1862.

1415. H. Walker, Gresham-street—Imp. in making handles for crotchet needles, pencils, penholders, and other articles.
1417. G. Fuhrmann, 15, Passage des Petites Ecuries, Paris—Imp. in melting and boring cast-iron barrels, applicable to fire-arms and pieces of ordnance. (A com.)
1419. J. B. Pope, Haigh Moor Collieries, near Leeds—Imp. in apparatus for lowering and loading coals, minerals, or other substances.
1421. H. S. Firman, 73, Great Suffolk-street, Southwark—Imp. in apparatus for washing and cleansing textile fabrics or raw materials, and for forcing fluids or moisture from the same. (A com.)
1423. H. Bayley, Stalybridge, L. Newton, Oldham, and J. Greaves, Stalybridge—Imp. in machinery for turning, boring, cutting, shaping, and reducing wood and other substances applicable for the manufacture of various articles.
1425. Maj.-General W. N. Hutchinson, Plymouth—An imp. in screw propelled ships.
1427. H. Ashworth, Hyde, Cheshire—Imp. in machinery for opening and carding cotton and other fibrous substances.
1429. A. B. Freeland, 4, Chatham-terrace, Palace-road, Upper Norwood—Imp. in the preparation or treatment of hops.
1431. T. Buckney, Peckham Rye—Imp. in portable " tell tale" timekeepers. (A com.)

Dated 13th May, 1862.

1433. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in the mode of carrying out submerged and other engineering works. (A com.)
1435. P. M. Lopez, Paris—Imp. in apparatus for sowing wheat or other grain or seeds.
1437. W. E. Newton, 66, Chancery-lane—Imp. in coffee pots and boilers for culinary purposes, part of which improvements are also applicable for generating steam. (A com.)
1439. G. Blake, Trowbridge, Wiltshire—Imp. in apparatus for warming apartments.
1441. R. A. Boyd, 11, Duke-street, Southwark—Imp. in the manufacture of bacon.
1444. W. Hartican, Islingword-road, Brighton—Imp. in fire-escape apparatus.
1445. R. A. Brooman, 166, Fleet-street—An improved means or apparatus for shunting trains. (A com.)
1447. W. Southwood, Kensington—Imp. in machinery for manufacturing nails from either hot or cold bars of iron or other metal.
1448. R. M. Latham, 71, Fleet-street—Imp. in steering apparatus. (A com.)

Dated 14th May, 1862.

1543. R. A. Brooman, 166, Fleet-street—An improved method and apparatus for the production of photographic and stereoscopic portraits and pictures. (A com.)
1454. J. W. Girdlestone, Canada Works, Birkenhead—Imp. in projectiles.
1455. H. Deacon, Appleton-house, Appleton, Lancashire—Imp. in the manufacture and production of certain colours, and in the apparatus employed therein.
1457. E. Whittaker and J. Clare, Hurst, Lancashire—Imp. in machinery or apparatus for preparing cotton and other fibrous materials to be spun.
1459. J. Smith, sen., Coven, near Wolverhampton—Imp. in thrashing machines.
1461. A. Nicole, 14, Soho-square—Imp. in stop watches and time keepers, and in instruments for measuring accurately short intervals of time.

Dated 16th May, 1862.

1478. P. M. Parsons, Blackheath—Imp. in ordnance and other fire-arms, and in tools for rifling the same.
1480. G. Hasletine, 100, Fleet-street—Imp. in churns. (A com.)
1484. A. A. Lamiable, 4, South-street, Finsbury—Imp. in cementing cast and wrought iron to obtain cast steel.
1488. G. Davies, 1, Serle-street, Lincoln's-inn—Imp. in the manufacture of ribs for umbrellas and parasols, part of which is applicable to the hardening of strips of steel generally. (A com.)
1492. F. Stocken, Halkin-street, Grosvenor-place—Imp. in carriages.
1494. A. V. Newton, 66, Chancery-lane—Improved machinery applicable to the cutting of leather and other like uses. (A com.)

Dated 17th May, 1862.

1496. C. Binks, Parliament-street, Westminster—Improved methods of obtaining oxygen and chlorine gases.
1498. R. Davison, London-street, and T. Johnson, Bermondsey—Imp. in machines for washing and cleansing casks.
1500. J. Hogg, jun., 4, Orleans-villas, Twickenham—Imp. in book covers.
1502. J. C. Hill, Abergavenny, and D. Caddick, Ebbw Vale, Monmouthshire—Imp. in puddling furnaces.
1506. F. E. Sickels, Golden Cross Hotel, Strand—An improved apparatus for steering vessels.

Dated 19th May, 1862.

1508. J. Wright, 42, Bridge-street, Blackfriars—An improved method of sheathing iron or metal ships, in order to protect them from the action of salt water, fouling, and other such like influences.
1510. R. Ramsden, jun., Kingsland-road—Imp. in machinery or apparatus for mashing malt.
1514. J. Lee, Church-gate, Leicester—Imp. in the construction of traction engines.

Dated 20th May, 1862.

1518. M. A. F. Mennons, 24, Rue du Mont Thabor, Paris—Imp. in certain descriptions of breech-loading fire-arms. (A com.)
1524. W. Clark, 53, Chancery-lane—Imp. in paddle and other hydraulic wheels. (A com.)
1528. W. Petrie, Charlton, Kent—Imp. in vessels for boiling chemical products as sulphuric acid, and in apparatus for indicating the degree of concentration and temperature of such products in the boiler, which apparatus is applicable to other pyrometric purposes.

Dated 21st May, 1862.

1532. W. H. Burnett, Margaret-street, Cavendish-square—Imp. in the mode of working telegraphic lines, and in instruments and apparatus employed for telegraphic purposes.
1534. W. Bush, Tower-hill—Imp. in the construction of ships, and in shields or armour for ships and batteries.
1536. L. Leins, Bucklersbury—Imp. in travelling bags and apparatus used therewith.
1538. W. E. Newton, 66, Chancery-lane—Imp. in the manufacture of metallic or mineralised fabrics or surfaces. (A com.)

Dated 22nd May, 1862.

1540. C. W. Siemens, 3, Great George-street, Westminster—Imp. in electric telegraph apparatus. (Partly a com.)
1546. J. Kennedy, Whitehaven—Imp. in protecting the sides and decks of ships from the effects of projectiles.
1550. H. Cook, Manchester—Imp. in electric batteries. (A com.)
1552. W. Evans, Commercial-road East—Imp. in obtaining motive power by machinery.

INVENTION WITH COMPLETE SPECIFICATION FILED.

1547. A. B. Childs, 481, New Oxford-street—Imp. in wringing machines. (A com.)

PATENTS SEALED.

[*From Gazette, May 30th*, 1862.]

May 12th.
3024. G. Ralston.
3036. J. Hemingway.
3040. H. G. Hacker.
3044. R. A. Brooman.
3048. J. Knowelden.
3052. J. Cochrane.
3060. J. D. Napier.
3068. G. Clark.
3072. W. N. Hutchinson.
2167. S. Sheppard.
3185. A. Treuille and F. X. Traxler.
3196. W. Clark.
17. J. J. Gutknecht.
70. A.R. Le Mire de Normandy.
327. A. McKenzie & F. Panthel.
555. J. Sim.
794. T. Marsh.
903. H. Pooley, jun.
933. J. T. Loft.

[*From Gazette, June 3rd*, 1862.]

June 3rd.
3065. H. G. Schramm.
3067. T. Laws.
3069. R. Jolley.
3075. T. Mellodew, C. W. Kesselmeyer, and J. M. Worrall.
3076. B. W. Gerland.
3082. J. Fordred.
3090. H. Alexander.
3094. V. L. Daguzan.
3115. W. E. Wiley.
3117. W. S. Longridge.
3249. E. Lord.
3263. T. Green, W. Green, and R. Mathers.
368. T. Coltman.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, June 3rd*, 1862.]

May 26th.
1301. G. F. Chantrell.
1311. W. Weild.
1321. R. A. Brooman.
1275. T. Webb and J. Craig.
May 29th.
1331. O. Maggs.
1335. A. Micklethwate, J. Peace, and S. J. Hobson.
1390. R. Barclay.
May 30th.
1325. A. Smith.
1326. W. Grimshaw.
1395. C. De Bergue.
May 31st.
1361. J. Wilson.
1370. A. R. Arrott.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, June 3rd*, 1862.]

May 26th.
1243. C. T. Dunlop.
May 28th.
1224. J. B. Acklin.
May 31st.
1263. H. Cartwright.